Climate Change and Wild Animals: Key Ethical Perspectives

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Abstract: Climate change is already having significant impacts on wild animal species and individuals. While not all these impacts are negative, many individual animals will suffer declines in their welfare and some will die, and many species will move towards extinction, as the climate changes. From a number of ethical perspectives, these negative impacts of climate change matter. This paper will outline three such perspectives: those that emphasize the value of *species*, those that are primarily concerned with individual animals' *welfare*, and those that focus on climate *injustice*. Each of these perspectives appears to require an ethically-informed policy response to negative climate impacts on wild animals. However, I'll suggest, such different ethical perspectives don't always agree on what the best practical response actually is. This may make it more difficult to construct ethical policy and legal frameworks to respond to climate change in the context of wild animals.

Keywords: Climate change, ethics, wild animals, species, animal welfare, justice.

1 Introduction

Climate change is already having major impacts on wild animals, changing the ecosystems in which they live, and creating new challenges, as well as in some cases, new opportunities, for the animals concerned.[1] [2] These impacts, I will maintain, are of *ethical* importance from almost all perspectives in environmental and animal ethics. In this paper, I'll outline three rather different ethical positions – one based around the value of wild animal species, a second around wild animal welfare, and the third around justice to wild animals, and argue that climate change is ethically problematic from all three positions.[3] Given this, some kind of policy response appears to be needed ethically, either with the goal of reducing or eliminating the wrong, or attempting to repair or compensate for it. However, because these three ethical approaches understand the ethical problem differently, they do not always agree on what kinds of strategies should be adopted. This creates difficulties in clearly

[1] Camille Parmesan, 'Ecological and evolutionary responses to recent climate change' (2006) 37 Annual Review of Evolution, Ecology and Systematics 637.

[2] Wendy B. Foden, Bruce E. Young, H. Resit Akçakaya, Raquel A. Garcia, Ary A. Hoffmann, Bruce A. Stein, Chris D. Thomas, Christopher J. Wheatley, David Bickford, Jamie A. Carr, David G. Hole, Tara G. Martin, Michela Pacifici, James W. Pearce-Higgins, Philip J. Platts, Piero Visconti, James E. M. Watson, Brian Huntley, 'Climate change vulnerability assessment of species' (2019) 10 Wiley Interdisciplinary Reviews: Climate Change, e551.

[3] These three accounts are not intended to be comprehensive; there are also *biocentric* positions on which wild animals matter as individual living organisms, and *ecocentric* positions on which wild animals matter as ecosystem members. These are likely to produce even more divergence in policy terms, so would serve to reinforce the main point I'm making here.

articulating "ethical" climate policies, and perhaps legal frameworks, for responding to wild animals affected by climate change. However, as I will conclude by suggesting, there are at least some practical strategies that might be supported from several different ethical perspectives; such strategies may be an especially firm foundation for ethical policies and legal frameworks responding to wild animals threatened by climate change.

2 Wild Animals and Climate Change

In order to discuss the impact of climate change on wild animals, I should first say something about how I'm using these terms.

First, I'm taking *climate change* to refer to the long-term shifts in climate and typical weather patterns being brought about by human-originating emissions of various gases, in particular from the burning of fossil fuels such as coal, oil and gas. Importantly for the argument here, I'm taking climate change to be *anthropogenic*.

Second, *wild animals* is a particularly difficult term to define because it's used in so many different ways – for instance, to describe animals that are not tame, or alternatively not domesticated, or that are living in unmanaged locations, or that are free-living and relatively autonomous, or that are not dependent on human provision. While in some ethical discussions these distinctions are very important, for my purposes here, a fairly broad definition will suffice: I will be thinking about undomesticated, free-living animals; but these animals could be living in many different kinds of environments, and have a variety of different relationships with human beings.

The changing climate is affecting wild animal habitat, access to food and fresh water, and distribution of disease. It's intensifying extreme weather such as storms, heavy rainfall, heatwaves, and drought; melting glaciers, permafrost, and sea ice; and causing sea level rise.[4] Many, perhaps most, wild animals are living in significantly changing environments. What does this mean for the wild animals concerned?

Many of these changes are having negative impacts on wild animals, leading to local and global species extinctions and the suffering and death of individual animals. At species level, the first mammal species to have been driven to extinction by climate change appears to be the Bramble Cay melomys, which lived on coral keys in Eastern Australia; unusually high king tides seem to have drowned all remaining members.[5] Over time, 16 to 30% of species are predicted to be threatened with extinction due to climate change, unless there's a shift in climate policy.[6] Huge numbers of *individual* animals are also threatened by climate change. A billion animals, for instance, are thought to have died in Australia's intensified wildfires in 2020[7], while extreme flooding displaced millions of wild animals in Pakistan in 2022.

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[4] IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability'. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf,S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA.

[5] Graham Fulton, 'The Bramble Cay melomys: the first mammalian extinction due to human-induced climate change' (2017) 23 Pacific Conservation Biology 1.

[6] Mark C. Urban, 'Accelerating extinction risk from climate change' (2015) 348 Science 571.

[7] The University of Sydney 2020 'More than one billion animals killed in Australian bushfires' [blogpost]. *The University of Sydney*, January 8. <https://sydney.edu.au/news-opinion/news/2020/01/08/australian-bushfires-more-than-one-billion-animals-impacted.html> accessed 15 November 2022.

Alongside these serious threats, climate change will also deprive some animals of positive welfare they might otherwise have had. For example, if population sizes reduce, animals may be deprived of preferred mate choices, or even of opportunities to mate altogether.

Having said all this, there's a need for some caution here; wild animals are not entirely without resources to respond to climate change. Specialist species with very particular niches and needs are more threatened than generalist species that can (for instance) shift their diet, thrive in different environments, and exhibit flexible behavior. Indeed, some species can be expected to thrive under climate change. Nine-banded armadillos, for instance, are marching north into states like Illinois from the south-eastern states of the US to which they were once confined.[8] And many species can adapt to a changing climate to at least some degree. Some are shifting their range towards the poles or higher altitudes where it's cooler, migrating earlier in the spring or later in autumn, or migrating shorter distances, to take advantage of earlier springs and warmer winters. Many wild animals are showing "behavioral plasticity" – that is, changing how they behave in response to a changing environment – for instance by foraging at different times of day, or staying in the shade.[9] And there's already evidence of evolution in response to climate change. Between 1989 and 2018, the body mass of North American birds declined by 0.6% on average, likely because being smaller helps keep birds cooler.[10] The Turks and Caicos Islands anole, a kind of lizard, has recently evolved stronger front toe pads and lighter back legs, allowing it to cling onto branches during intense hurricanes with its front feet, while its back feet fly loose in the wind.[11]

So, wild animals should not be seen wholly as victims of a changing climate. Nonetheless, climate change does threaten the existence, either globally or locally, of numerous species, and it potentially brings negative welfare impacts and death for many millions of animals. And even where wild animals are able to adapt to slower, more incremental changes, outbreaks of extreme weather, floods and intense wildfires are much more difficult to manage, leading to injury and death.

This conclusion is not new; it's in line with what most recent work in ecology and conservation has established, although here the emphasis has primarily been on species, populations, and biodiversity, rather than on animals as individuals. However, I now want to consider what this might mean in ethical terms.

3 Climate Change, Wild Animals and Ethics

The impacts of climate change on wild animals can be argued to matter ethically in a variety of ways. Here, I'll focus on just three different kinds of ethical concerns (these can reasonably be thought of as three of the most significant, though this account is very far from comprehensive). The first ethical concern is wild animal *species:* the

[8] Carly Haywood, Clayton K. Nielsen and F. Agustín Jiménez, 'Potential Distribution of Colonizing Nine-Banded Armadillos at Their Northern Range Edge' (2021) 13 Diversity 266.
[9] E.A. Beever, E. A., Hall, L. E., Varner, J., Loosen, A. E., Dunham, J. B., Gahl, M. K., & Lawler, J. J. 'Behavioral flexibility as a mechanism for coping with climate change' (2017) 15 Frontiers in Ecology and the Environment 299.
[10] Casey Youngflesh, James F. Saracco, Rodney B. Siegel and Morgan W. Tingley, 'Abiotic conditions shape spatial and temporal morphological variation in North American birds' (2022) 6 Nature, Ecology & Evolution 1860.
[11] Colin Donihue, Anthony Herrel, Anne-Claire Fabre, Ambika Kamath, Anthony J. Geneva, Thomas W. Schoener, Jason J. Kolbe, Jonathan B. Losos, 'Hurricane-induced selection on the morphology of an island lizard' (2018) 560 Nature 88.

possibility of the loss of whole species or at least whole populations to climate change. Both the second and the third ethical concerns are about *individual* wild animals. The second focuses on minimizing negative animal welfare impacts from climate change, a view which I'll call welfare-consequentialist; the third is concerned that climate change is an *injustice* to individual wild animals, in that humans are *causing* welfare loss and death. (Although I won't discuss this here, something like this third concern might be extended to species, depending on particular views about what kinds of things species are and why they matter). I will consider these three views in turn.

3.1 The Loss of Valuable Species

As I've pointed out, climate change threatens whole species, and even where species as a whole are not threatened, particular places or regions may lose entire populations. But why does this matter *ethically?* Of course, many species are important to humans: they may be directly useful for food, or fabric; they may be of cultural, historical, or aesthetic value, or they may provide other ecosystem services. However, what's of primary importance here are the many arguments that species have, in some sense, *intrinsic* value, or that they are *morally considerable,* independently of any concern about their usefulness or how they make us feel.[12] Such arguments have been proposed within conservation biology and by some environmental ethicists. For example, Michael Soulé, in his foundational paper "What is Conservation Biology?" maintained that "Species have value in themselves, a value neither conferred nor revocable, but springing from a species' long evolutionary heritage and potential or even from the mere fact of its existence."[13] Within environmental ethics, arguments for the intrinsic value of species take varied forms. J. Baird Callicott, for instance, argues that species have subjective intrinsic value – that is, that humans value species in themselves, independently of their usefulness;[14] while Holmes Rolston III maintains that we have duties to protect species as whole "forms of life" with *objective* value, that is, value independent of human valuation.[15] Most recently Ian Smith (2016) argues that a species can have interests and a good of its own, and that this good consists in reproducing successfully and remaining safe from extinction. As such, Smith argues, species have intrinsic value, and it would be virtuous of us to preserve that value – especially where we are the ones threatening it.[16]

While none of these arguments insist that species preservation should be prioritized over everything else, they all maintain that species extinction means the loss of intrinsic value. Other kinds of value are, of course, at stake here too, as I'm about to argue. But the value of wild animal species is a widely asserted ethical reason for concern about the impacts of climate change.

[12] Rick O'Neil, 'Intrinsic Value, Moral Standing and Species' (1997) 19 Environmental Ethics 44.
[13] Michael Soulé, 'What is Conservation Biology?' (1985) 35 Bioscience 727.
[14] J. Baird Callicott, 'The Intrinsic Value of Nonhuman Species' in Bryan Norton (ed) *The Preservation of Species: The Value of Biological Diversity*, (Princeton, N.J.: Princeton University Press, 1986), p. 160.
[15] Holmes Rolston III 'Duties to endangered species' (1985) 35 Bioscience 718.
[16] Ian Smith, *The Intrinsic Value of Endangered Species* (Routledge 2016).

3.2 Individual Sentient Animals

3.2.1 Animal Welfare

Before moving to consider welfare consequentialist and justice accounts, I should first say something about the term "animal welfare". The most prominent accounts of animal welfare interpret it in terms of *subjective experience*, maintaining that suffering is intrinsically bad, and happiness intrinsically good. Good welfare, whether human or non-human, is therefore measured in terms of positive experiences of pleasure and negative feelings of pain and suffering. (This is sometimes called a *hedonistic* account of welfare.)[17] Other accounts of welfare emphasize *desire-satisfaction*, the idea that good welfare should be measured in terms of the satisfaction of an animal's desires or preferences, and bad welfare in terms of the frustration of their desires. Yet other accounts measure welfare in terms of animals' freedoms to carry out *natural or species-specific behaviors*, independently of how animals actually feel, though such accounts are highly contested.[18] And some interpretations are pluralistic, adopting multiple different lenses on welfare.[19] Although climate change is likely to have negative impacts on the welfare of many animals understood in all these ways, a hedonistic account (for instance) might be concerned about somewhat different climate effects than a natural-behavior account. This is relevant for thinking both about welfare consequentialist and justice approaches.

3.2.2 Welfare Consequentialism

Welfare consequentialism is comprised by a group of views that aim to bring about the best consequences in terms of animals' welfare, however welfare is understood.[20] Inasmuch as climate change will negatively impact wild animal welfare (for instance, by increasing suffering or reducing happiness, frustrating basic desires, or preventing the performance of natural behaviors), it's seen as ethically problematic. Take, for example, one of the commonest views here, *hedonistic utilitarianism*, with its focus on minimizing suffering and maximizing pleasure. This implies an ethical obligation to intervene to improve the welfare of suffering animals, unless such intervention predictably risks making *overall* welfare worse. But it's worth pointing out, on this view, that such a duty to intervene applies to *all* wild animal suffering, not just that caused by anthropogenic climate change. The fact that suffering is caused by people doesn't give it any special moral force; what matters is not where the suffering comes from, but how severe it is and how tractable it is. Suffering that's very severe and tractable should be tackled first. So, on this view, if wild-animal suffering from climate change is very severe, we can do something effective about it, and what we do isn't likely to create more future suffering or to substantially reduce pleasures, we have a moral responsibility to try to relieve it. And while I've focused on suffering here, similar arguments can be made were welfare to be understood in terms of desire-frustration or constraints on performing natural behaviors. If climate change is

[17] Roger Crisp, 'Well-Being' in Edward N. Zalta (ed), *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition) <https://plato.stanford.edu/archives/win2021/entries/well-being/> accessed 15 November 2022.
[18] See, for instance, Heather Browning, 'The Natural Behaviour Debate: Two Conceptions of Welfare' (2020) 23 Journal of Applied Animal Welfare Science 325.
[19] Walter Veit and Heather Browning 'Perspectival pluralism for animal welfare' (2021) 11 European Journal for Philosophy of Science.
[20] There are some views that aim to "satisfice" rather than bring about the best consequences, but I'll put these on one side for now.

causing extreme desire frustration in wild animals (for instance, they strongly desire to drink, but no water is available) then other things being equal we should try to relieve it; likewise, if climate change is preventing the performance of natural behaviors – for instance, foraging in the sun, or swimming – then it is morally problematic.

3.2.3 Approaches Based on Justice

Another group of ethicists argue that *anthropogenic* impacts on welfare, including wild-animal suffering from climate change, should be understood differently from poor welfare *not* caused by humans, for instance, the suffering caused by predation.[21] Human beings are, on this view, *morally responsible* for climate change because – to adopt an argument from Nolt, (2011) – they can cause or prevent the harm; they can recognize it as morally significant; they can anticipate the harm reliably and they are not forced to behave in this way; there are alternative, less harmful possibilities.[22] What's more, climate change might be seen as a particularly unfair situation, because the benefits from burning fossil fuels all accrue to human beings (of course, not evenly); while wild animals are bearing and will bear in the future very significant costs, without any responsibility for or any benefits from the use of fossil fuels.

On this view, then, it matters that the wild animal suffering caused by climate change is anthropogenic. Since humans – or some humans – caused it, they are responsible to do something about it, and to help those animals that they have made vulnerable or caused to suffer. In the animal ethics literature, this is frequently discussed in terms of justice and, especially, animals' rights.[23] Climate change is understood here as an infliction on wild animals for which something is owed – an obligation to reduce or avert the injustice, to assist in adapting to the new situation, or to carry out some kind of moral repair.

Arguments that climate change is unjust to wild animals, and that such injustices should be stopped or rectified, however, run into difficulties about who is responsible to act. So far, I've talked rather casually about "humans" being responsible; but obviously, some humans are much more responsible than others (and of course, many *humans* have also been unjustly affected by the negative impacts of climate change.) Because the idea of climate justice to wild animals is about causal responsibility, it does require consideration of complicated issues concerning *who* is responsible for *what* that I don't have space to tackle here. This problem is somewhat mitigated in the case of wild animals, however, as plans to assist wildlife in the context of climate change would generally be the responsibility of wildlife agencies and NGOs, rather than individual humans.

So far, then, I've outlined three ethical reasons for concern about the impact of climate change on wild animals: the loss of valuable wild animal species and populations, the welfare loss (such as suffering) caused to individual animals, and the injustice of humans perpetuating and benefiting from practices that are causing harms to wild animals. But what are the implications of this for ethical policy responses to climate change?

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[21] Clare Palmer, *Animal Ethics in Context*. (Columbia 2010).
[22] John Nolt, 'Nonanthropocentric Climate Ethics' (2011) 2 WIRES Climate Change 700.
[23] Angie Pepper, 'Adapting to Climate Change: What We Owe to Other Animals' (2019) 36 Journal of Applied Philosophy 592.

4 Ethical Responses to Climate Change

From all three positions, climate change is ethically problematic. As such, some kind of policy response appears to be needed, either to stop the moral wrong or in some way to repair or compensate for it. The difficulty here though, as I'll attempt to show, is that because these three different ethical approaches understand the basic ethical problem differently, they won't always agree on what policy responses are most appropriate. This is not an overwhelming problem, but it certainly makes decision-making more complicated. In the upcoming sections of the paper, I'll try to explain this, using some specific examples.

However, there's one issue I should clarify first. One obvious thought here might be that the best way of doing anything to help reduce species extinction, impacts on wild-animal welfare, or injustice from climate change is *mitigation* – tackling the problem at its source by reducing carbon dioxide emissions or developing and expanding ways of carbon capture. And of course, in the long term, this is right. However, this is a global strategy that will take decades to unfold, and as negotiations at various recent COP meetings indicate, is facing headwinds. The global mitigation process, if successful, will over time reduce the number of species that go extinct. However, it won't much help species declining rapidly over the next couple of decades, nor individual animals caused suffering or injustice now. It's for this reason that those concerned both for wild animal species and wild animal individuals are focusing on what is sometimes called "adaptive assistance" – helping wild animals either as species or as individuals to adapt and survive in the face of a changing climate.

What strategies are actually available to do this? Traditional approaches to conserve wild animal species have generally focused on protection by setting land aside, creating nature reserves where wild animals can live relatively free of human intervention; indeed, recent research suggests that creating legally protected areas is still the most common response.[24] This can be especially helpful to climate-threatened wild animals where protecting land increases connectivity, giving wild animals more opportunities to migrate or relocate in response to a changing climate. But in many cases where climate change (rather than other human activity) is the threat, setting land aside may not be very effective. Even in designated wilderness areas the climate is changing, there will be climate-enhanced floods, droughts, and wildfires, and ecosystems will shift around the animals; this means that neither species nor individuals will necessarily be protected by such "hands-off" strategies.

Other traditional conservation strategies may help here, however. For instance, one way of assisting species under climate pressure is to reduce other, non-climate stressors such as pollution or hunting. Another is to create new habitat where habitat has been lost – for instance, creating new freshwater habitat where rising sea levels mean that formerly freshwater habitat has been salinized. Other possibilities include the extension of traditional, but less used, strategies to assist wild animals, such as augmenting food supplies or creating supplementary food and/or water sources if there are changes to food access, and rescuing wild animals from extreme situations such as flooding. Beyond this, there's a range of more radical, much less traditional interventions that include genetic manipulation (for instance, gene editing populations to increase their resilience to particular features of climate change, such

[24] Olivia E. LEDee, Stephen D. Handler, Christopher L. Hoving, Christopher W. Swanston, Benjamin Zuckerberg, 'Preparing Wildlife for Climate Change: How Far Have We Come?' (2021) 85 Journal of Wildlife Management 7.

as increased temperatures) or assisted migration (moving wild animals to new habitats with a more suitable climate, frequently beyond their historical range). These more radical strategies may, however, present complex policy and legal problems. More directly for my concern here, the three different ethical approaches I've discussed don't always agree about which strategies should be pursued. I'll consider some cases here that outline both possible convergence and divergence between these ethical approaches.

5 Convergence and Divergence in Ethical Climate Strategies

I'll begin with a case that looks like *convergence* – where all three of these approaches are likely to agree on a particular strategy. Owing at least in part to climate change, water resources used by wildlife in areas of Mexico's Yucatan Peninsula are drying out. Animals such as the endangered Central American tapir are unable to find enough water as the small, shallow lagoons on which they rely are disappearing. This enhances threats to the Central American tapir species, leads to welfare decline for individual tapirs (however welfare is interpreted) and is an anthropogenic harm; so, it's a problem on all three ethical approaches. In response to this threat, the WWF is proposing to install and monitor artificial water sources in the area.[25] Let's assume (for the purposes of the argument) that doing so would not cause problems to some other species/sentient beings elsewhere. Then installing these water sources could help to protect the endangered Central American tapir species, improve the welfare of animals that otherwise would suffer and perhaps die from thirst, and prevent the unjust harm that would be caused by anthropogenic water loss to wild sentient animals. This strategy looks effective even with different accounts of welfare, since tapirs surely desire water, and having access to drink it would give them better ability to fulfil their natural behavior. It's likely, then, that all three approaches would agree on this policy (although for welfare-consequentialists, the costs and benefits of introducing artificial water sources would have to be compared with the costs and benefits of spending similar amounts of resources on other projects; it's possible that more welfare could be gained from an alternative strategy).

However, while there's strategic convergence in this case, significant divergence is likely in many others. Central American tapirs are herbivores; improving their welfare is unlikely to have negative implications for other animals. But suppose the animals at issue were members of an endangered *predator* species, and that the water resources would only help this species. From a species-oriented view, this would not change the situation: if artificial water sources would save the species, there's a good ethical reason to provide them. A similar argument might be made from a justice-oriented view: if providing predators with water protects them from the injustice, or rights violations, brought about by anthropogenic climate change, then provision of artificial water sources seems ethically justified. However, many welfare-consequentialists in animal ethics – especially those concerned about suffering, who predominate – are uneasy about predation in general, and therefore concerned about offering resources to predators.[26] Providing artificial water sources for predators could only be justified if it reduced suffering overall; and this would need to take into account

[25] Worldwide Fund for Nature. How artificial waterholes help Mexico's wildlife survive Mexico's changing climate <https://www.worldwildlife.org/stories/how-artificial-watering-holes-help-wildlife-survive-mexico-s-changing-climate> accessed 3 August 2023.
[26] For instance, Tyler Cowen 'Policing Nature' (2003) 25 Environmental Ethics 169.

the suffering *caused* by predators now able to flourish because water has been provided. After all, if the predators cause more suffering to their prey than the lack of water causes to the predators, then providing the water just increases, rather than decreases overall suffering.

And provision of water is not the only example here. Short-term supplementary feeding of polar bears has been proposed for the predicted occasions when the ice they need for hunting forms so slowly in the autumn that they may otherwise starve.[27] Both species-preservation and justice-oriented views may argue in favor of such assistance; it could help both in conserving the species and in at least making a move towards rectifying an injustice caused by climate change. But since polar bears are predators who largely subsist by killing ringed seals, helping them might not be a strategy acceptable on a welfare-consequentialist view. While the sums *might* work out in favor of the predators like polar bears, protecting them from climate impacts is much less obvious than it would be on the species- or justice-based views.

This is not the only area of potential disagreement, however. Justice-based views are much less likely to support strategies that have the effect of harming some individuals in order to benefit a greater number of other individuals, or to preserve a species. An example may help to make this clear. Pepper, an animal rights theorist (mentioned above) argues that, as a matter of climate justice, "nonhuman animals are owed adaptive assistance to help them cope with the ill-effects of climate change."[28] She considers several ways in which animals might be helped, including assisted migration, on which I'll focus here. Assisted migration, as noted above, translocate animals to new habitats more suitable given a changing climate. But as Pepper notes, all translocations pose risks to the animals concerned, and in some species, those risks are high, especially for the first generation of animals moved. And it's this that could wedge different ethical approaches apart.

Suppose that the ethical goal of an assisted migration is to conserve a species. While there may be significant losses of individual animals in the first translocated generation, if there's a good chance of the translocation succeeding over time, then species conservationists are likely to support it. It may mean that viable populations of the species can persist despite the changing climate. Welfare consequentialists *may* also accept translocation to improve overall welfare in circumstances like this – but this would need to be taken on a case-by-case basis. First, whether to proceed would depend on the species at issue (so, as discussed above, there's unlikely to be support for the translocation of members of predator species). And second, whether to proceed will also depend on how the expected "welfare-sums" add up. This means thinking about the negative welfare created and the positive welfare lost due to climate change, if populations are *not* translocated, against the welfare losses and gains if they are – including the potential creation of flourishing future populations that wouldn't have existed without translocation. If both the welfare losses brought about by climate change, and the welfare gains brought about by translocation, are high then welfare-consequentialists could accept significant welfare losses and deaths of animals in the process of carrying out that translocation. This won't be true in all cases, but there's no in-principle objection to sacrificing some animals' lives and welfare now for welfare gains in the future (including the creation of future animals that wouldn't otherwise have existed).

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[27] Andrew Derocher et al 'Rapid ecosystem change and polar bear conservation' (2013) 6 Conservation Letters 368.

[28] Angie Pepper, 'Adapting to Climate Change: What We Owe to Other Animals' (2019) 36 Journal of Applied Philosophy 592.

On a justice view, however, assisted migration is even more complicated. Unlike on a welfare-consequentialist view, there isn't an aggregation process here. If some animals will plausibly be harmed or killed by being translocated, then on many justice views, the translocation should not be carried out, *even if* doing so would lead to flourishing populations down the line. Take a leading animal rights view such as that of Donaldson and Kymlicka, who argue that sentient animals have inviolable rights that cannot be sacrificed for the greater good of others.[29] Translocating animals at very high risk to their lives is surely rights-violating on this account, causing new injustices to animals that are already suffering from injustice. For strong rights views like these, the only justification for carrying out such translocations would be if the individual animals being translocated were *themselves* so threatened by climate change (also taken to be rights-violating) that the risk from moving the animals is a risk worth taking *for them*. Of course, not all justice-based views are as stringent as this; some rights views don't apply rights-based side constraints so strongly; and other justice approaches would allow for at least some consideration of the benefits of assisted migration in terms of restorative justice.[30] But again, this would require consideration of the specific case – and the kind of case that's ethically acceptable on a *justice* account may not coincide with the cases ethically acceptable on a *welfare consequentialist* account.

6 In Conclusion

Climate change threatens species, will reduce the welfare of many wild animals, and can be seen as an injustice to individual wild animals. From all these ethical perspectives, adaptive assistance appears to be an ethically justified – perhaps required – policy response. However, because the ethical focus of these perspectives is so different: species value, welfare, justice – what *counts* as appropriate adaptive assistance will often diverge. For those primarily concerned about preserving *species* values, animal welfare and justice to individuals may not matter very much. Those for whom maximizing good *animal welfare* is a priority won't wish to assist species or individuals if such assistance is likely to reduce welfare overall, however rare the species concerned. And those primarily concerned about justice will not want to undertake assistance that plausibly itself causes new injustices – and this is likely to apply not only to assisted migration, but also to other practices that may cause harms to some in order to create or help others, such as captive breeding, de-extinction and genetic rescue – even though these practices may save species and boost welfare overall.

All this means that while the negative impacts climate change is having on wild animals are increasingly severe, and unethically unjustifiable from a multiplicity of ethical perspectives, what is to be done about it – ethically, at least – is much less obvious. What's meant by "success" in ethical terms is complicated, given that so many different ethical goals may exist.

One way forward here – given the high numbers of climate-induced problems wild animals face – is to prioritize those policies and strategies on which different ethical approaches *can* agree. I began with a case like this: the provision of artificial water sources to the central American tapir. Another recent case is the provision of supplementary water to tule elk at Tomales Point in California in an intense, climate-

[29] Sue Donaldson and Will Kymlicka *Zoopolis: A political theory of animal rights*. (Oxford 2011).
[30] Thanks to an anonymous referee for making this point.

enhanced drought.[31] This water provision is likely to help both the population and species to persist, to reduce the number of elk suffering poor welfare from the drought (without creating serious threats to the welfare of other animals) and to help repair injustice caused by the likely anthropogenic enhancement of the drought.

To conclude then: Climate change does pose ethical problems with respect to wild animals, but these problems can be understood very differently from different ethical perspectives, leading to disagreements about whether, when, and how to assist. When reviewing strategies, policies, and legal frameworks for responding to climate change in the wild, it would be helpful – at least in ethical terms – to consider all these different perspectives. Responses that are likely to succeed in conserving species, improving welfare *and* responding to or preventing injustice are, in terms of ethics at least, surely particularly desirable and worth pursuing.

[31] National Parks Service, Tule Elk at Tomales Point FAQ <https://www.nps.gov/pore/learn/nature/tule_elk_tomales_point_faq.htm> accessed 13 November 2022.